

Chapter 2

Going by Boat

The Forager–Collector Continuum at Sea

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INTRODUCTION

In 1990, Binford argued that logistical mobility strategies...

are the consequence of two major evolutionary changes that occurred long ago: (1) the “aquatic resource revolution” with its early occurrence primarily in higher latitudes, and (2) the perfection of transport technologies, particularly water transport vessels and the use of pack and draft animals. (Binford 1990: 138)

Hunter-gatherers that pursue aquatic resources will be strongly logistical in their mobility strategies. In fact, they are virtually obligatory collectors (Binford 1990). Following Binford, I will accept these statements as guides to further research. The purpose of the current paper is to explore two broad implications of these statements.

First, it has long been recognized that in contrast with terrestrial, pedestrian hunter-gatherers, aquatic hunter-gatherers tend to have higher population densities (e.g., Renouf 1988; Keeley 1988), to be residentially more stable, i.e., more sedentary, and to be perhaps more socially and economically complex than most terrestrial hunter-gatherers. Explanations for the causes of these apparent distinctions commonly focus on the relative or absolute productivity and dietary value of aquatic relative to terrestrial resources. In these discussions, lip service is paid to the importance of

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"transport technologies," but their importance is rarely investigated. However, access to waterborne transportation alone can have a significant positive impact on population size and stability (Batten 1998). This implies a more complex (and interesting) interplay between environment and technology in the evolution of mobility strategies than is generally appreciated.

Secondly, most aquatic hunter-gatherers are collectors, following Binford's basic definition that collectors move resources to people. However, archaeological expectations for recognizing collectors and foragers are based on terrestrial hunter-gatherers. There are important differences between aquatic and terrestrial hunter-gatherers, due, in part, but not exclusively, to differences in transport. These differences mean that the archaeological record of terrestrial and aquatic collectors may be quite different from each other, at least in degree. A question arising from these considerations is whether these differences in degree are, cumulatively, differences in kind. If this is so, a further question is whether comparative analyses, such as those of Binford (1980, 1990), Keelley (1988), and Kelly (1995) that are based on ethnographic samples with significant numbers of aquatic hunter-gathers, are therefore flawed (see Yesner 1980 for an early argument to this effect).

This paper is about boats, but it is about boats as transportation, about the integration of boats into production on a daily basis, about boats being used to haul material 100 meters across a lake or 1000 kilometers over difficult seas. It is not about the evolution of boats or about evidence for the earliest boats, or about boats as the only way to get to Australia, or as a means to people the Americas. It is about boats as instruments of production and whether the use of boats is theoretically important.

AQUATIC HUNTER-GATHERERS

What to call the people who are the focus of this paper? Binford (1990) uses the term "aquatically oriented hunter-gatherers." These are people who are "dependent" on aquatic resources, by which he means aquatic hunting and fishing, but not collecting aquatic or hydrophytic plants. When Kelly (1995) speaks of aquatic resources, he clearly means fishing and sea-mammal hunting. My meaning of the term is somewhat broader. Aquatic hunter-gatherers are those whose production activities rely on water for procuring food, other resources, and for transportation. I use this term because there is no alternative that clearly distinguishes these from terrestrially based economies. "Maritime hunter-gatherer" generally refers to people who exploit marine environments, be they close inshore littoral environments or distant pelagic ones. The phrase has always struck me as both too broad and too narrow. It is too broad because it can be applied,

and often is, equally to people, like the Aleut, who hunt whales in open water with highly evolved tackle, including their vessels, and to those who are essentially strandloopers, collecting mollusks and exploiting near-shore environments without specialized gear or tackle. Lyman (1991) calls the latter a "littoral" adaptation and reserves the title "maritime" for the former, with its specialized gear and knowledge. This distinction is at the heart of Lyman's debate with Hildebrandt and Jones over whether people along the Oregon coast hunted seals from boats in open water or clubbed or speared them in their rookeries (Hildebrandt and Jones 1992; Lyman 1995; Jones and Hildebrandt 1995). Lyman's distinction, useful as it is, does not capture my meaning. Maritime is also too narrow because it does not apply to people who exploit wetlands, rivers, lakes etc.

The Chinookan peoples who lived in the Wapato Valley region of the lower Columbia River are a case in point. Although riverine fishing was central to their economy, they harvested a wide array of terrestrial, wetland, lacustrine, and riverine resources. It would, in fact, be difficult to categorize them as either terrestrial or aquatic hunter-gatherers based solely on the sources of their food resources. They, however, relied very heavily on canoes of a variety of shapes and sizes. They used these canoes to move resources and themselves across the landscape. It is as much this dependence on canoes that makes them aquatic hunter-gatherers as it is the salmon and sturgeon they harvested from their boats.

Binford's seminal paper on collectors and foragers (Binford 1980) was published in the same year as Yesner's on "Maritime Hunter-Gatherers: Ecology and Prehistory (Yesner 1980)." Yesner's article was something of a manifesto for the study of and theory building about maritime hunter-gatherers. He argued that modern hunter-gatherer studies may have little direct relevance for understanding ancient hunter-gatherers because, according to Yesner, most modern hunter-gatherers occupy marginal environments. He also criticized the methodology used by Binford and others to look for broad regularities or correlations between environment and economy, suggesting that such studies masked important dimensions of variability. He strongly implied that these studies are flawed by the use of the wrong scales of "cultural and ecological units for analysis (to avoid spurious correlations) (Yesner 1980: 728)." Yesner went on to argue that maritime hunter-gatherers are and were significantly different from modern, terrestrial hunter-gatherers in marginal environments. Like many others, Yesner also addressed the productivity of marine environments as a source of dietary calories, protein, and nutrients relative to terrestrial environments.

For Binford (1990: 134), the apparent increasing use of aquatic resources in the Holocene is "one of the major problems archaeologists have yet to address realistically in terms of the issues of complexity and human evolution." Debate over this question generally focuses on the

ecological productivity of aquatic (usually understood as marine) and terrestrial environments (e.g., Erlandson 1988, 1994; Keeley 1988; Osborne 1997; Perlman 1980; Schalk 1981; Yesner 1980). Here, I do not directly address the relative merits of the arguments of these authors; rather I explore an alternative or supplementary position, which is that the availability of efficient (or effective) transportation can have a significant positive impact on the net productivity of aquatic environments.

AQUATIC TRANSPORT

Batten examined the population histories of 327 European cities in the period from 1500 to 1800 A.D. to determine the relationship of city growth (as a measure of urbanization) and transportation. His actual concern was the impact of transportation on urbanization in ancient Mesoamerica. However, the European data provided (1) good estimates of population size, (2) precise estimates of age, and (3) good control over systems of transportation. Cities were assigned to three "transportation" categories: landlocked, river, and ocean (see Batten 1998: 494–496, for the way these seemingly broad categories relate to transportation). As a result of his analyses, Batten concluded:

1. Ocean cities (those accessible from the ocean, port cities) exhibited faster and more sustained growth during the period of his study.
2. Median populations of cities on water (both ocean and river) far surpassed those of landlocked cities.
3. Population sizes of landlocked cities were more subject to fluctuations. They were the only cities to lose populations during this period.
4. "Population should be proportional to the size of the food producing hinterland... if... food supply is an important part of the relationship between transport and population size (Batten 1998: 510).

Batten's results cannot be translated directly to hunter-gatherers. He was not certain they could be directly applied to urbanization in Mesoamerica from Europe. However, the implications are suggestive and do find some support from recent comparative work on modern hunter-gatherers. For example, both Keeley's (1988) and Kelly's (1995) data sets indicate that population densities for coastal hunter-gatherers are generally higher than among terrestrial peoples, although Keeley indicates that the differences are not large. However, if one compares coastal groups with adjacent terrestrial groups, rather than comparing them globally, the differences are more marked.

I calculated median, mean, and standard deviations (Table 2.1) and constructed box and whisker plots (Fig. 2.1) of the population densities for

Table 2.1. Descriptive Statistics of Population Densities (individuals/100/ km²) for Aquatic and Terrestrial Hunter-Gatherers in Western North America (density estimates from Kelly 1995, Table 6-4, 222-226)

Region	N	Mean Density	Std. Dev.	Median	Minimum	Maximum
California						
Aquatic	18	203.7	199.8	173	25	843
Terrestrial	25	125	91	103	12	103
Northwest Coast/Plateau						
NW Coast	16	68.3	49.2	61	10	195
Plateau	10	14.6	13.1	9.5	2	38
Arctic/Subarctic						
Coast	16	11	16.9	3.4	.5	65
Interior	23	1.5	1.9	.8	.2	7.6

aquatic and terrestrial hunter-gatherers in western North America, including California (aquatic and terrestrial¹), the Northwest Coast and Plateau,² and the Arctic and Subarctic.³ I used the density figures in Kelly's Table 6-4

¹I assigned groups to the "aquatic" and "terrestrial" classes based on my reading of ethnographies, particularly the accounts in the Handbook (Heizer 1978). This assignment was not always straightforward. Some groups located on or near the Pacific coast made almost no use of coastal resources, for example. On the other hand, salmon was an important resource for many peoples living in the interior of central and northern California. In this latter case, I generally assigned these groups to the terrestrial category because fishing was usually their only "aquatic" harvest, the rivers did not provide usable transportation routes, and they made little use of water plants.

²This comparison is between coastal peoples and those of the continental interior, rather than a clear-cut comparison between aquatic and terrestrial economies. The peoples along the Northwest Coast are straightforward examples of aquatic hunter-gatherers, although many groups generally considered maritime by anthropologists may have relied more heavily on terrestrial plant foods than typically thought (Duer 1999). The Plateau is not so straightforward. The Plateau of North America is the topographically complex region between the Cascade/Coast Ranges of the Pacific coast and the Rocky Mountains from southern Oregon to central British Columbia. Many peoples (but not all) of the Plateau heavily relied on salmon and other fish; canoe travel was also important, although how important is not known. However, Plateau groups also were very dependent on roots (e.g., Thoms 1989; Peacock 1998) and terrestrial mammals. Rather than trying to class Plateau groups as more or less aquatic and terrestrial, I compare the two large regions.

³All of the groups in the "aquatic" class are coastal, and most are found in the North American Arctic. Kelly's sample includes only the Aleut and Chugach from the Pacific coast of Alaska, not the Koniag of Kodiak Island and adjacent mainland areas. Virtually all the "terrestrial" groups are subarctic hunters, and most are Athabaskans. Interior Inuit groups include Nunamuit and Copper Eskimo.

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